

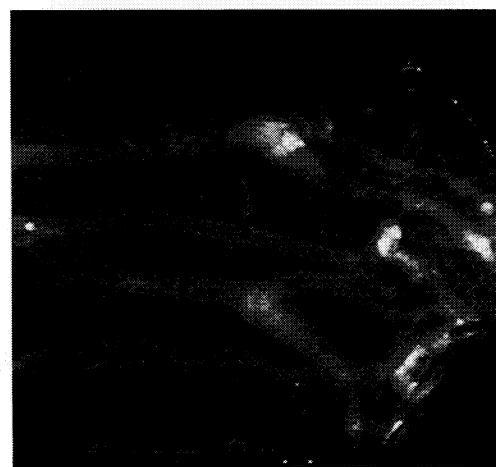
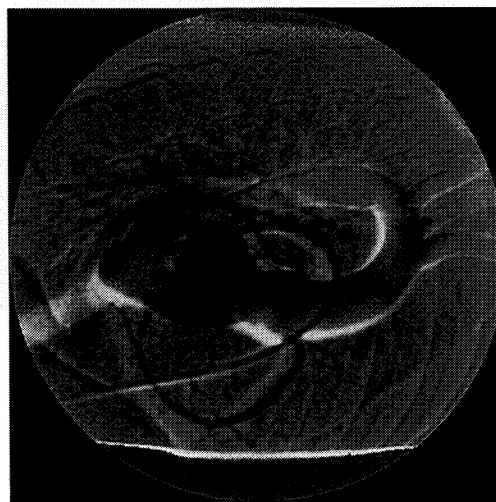
A unit of the Washington University School of Medicine, the Mallinckrodt Institute of Radiology (MIR) is engaged in medical research in such areas as computerized tomography, positron emission tomography, nuclear imaging, high energy radiation therapy and angiography. With more than 125 terminals, MIR's computer system is the largest radiology computer facility in the world.

Since 1979, the institute has been developing the MIR Digital Image Processing System, a transportable system for medical image enhancement. The system has many potential applications in diagnostic imagery analysis and has been used in digital vascular imaging studies of the coronary arteries. For these studies, blood vessels are injected with x-ray dye and images are produced over a period of time to analyze whether the arteries have narrowed, an indication of atherosclerosis (hardening of the arteries).

The accompanying illustrations exemplify digital image processing, which allows visualizing features that would otherwise not be visible. At upper right is a digital image of coronary arteries in a two-year-old child

with congenital heart disease. In the lower photo, the image shows the carotid arteries of a 50-year-old being evaluated for atherosclerosis. Comparison tests of the MIR Digital Image Processing System with routine cardiac examinations indicate that the system offers great potential in determining whether cardiac surgery is necessary.

The MIR system employs NASA-developed digital image processing technology, used to improve the quality of diagnostic examination by clarifying the images and extracting specific quantitative information on blood flow in the arteries. As a basis for developing the computer imaging routines for data processing, contrast enhancement and picture display, Mallinckrodt radiologists relied on a computer program, developed by NASA's Jet Propulsion Laboratory at the California Institute of Technology, known as Mini-VICAR/IBIS, for Video Image Communication and Retrieval/Image Based Information System. The program was supplied to MIR by the Computer Software Management and Information Center (COSMIC)[®], a unit of NASA's



technology transfer network. Located at the University of Georgia, COSMIC collects and stores government-developed computer programs that have secondary applicability and makes them available to industrial firms, government agencies and other organizations. ▲

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